FLIGHT
The AIRCRAFT ENGINEER & AIRSHIPS

First Aero Weekly in the World

Founder and Editor: STANLEY SPOONER

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport

OFFICIAL ORGAN OF THE ROYAL AERO CLUB OF THE UNITED KINGDOM

No. 912. (No. 24, Vol. XVIII.) JUNE 17, 1926 [Weekly, Price 6d. Post free, 7d.

## Flight

*The Aircraft Engineer and Airships*

*Editorial Offices:* 36, GREAT QUEEN STREET, KINGSWAY, W.C.2.
Telegrams: Truditur, Westcent, London. Telephone: Gerrard 1828.
Annual Subscription Rates, Post Free.

United Kingdom .. 30*s.* 4*d.* Abroad .. .. 33*s.* 0*d.**

These rates are subject to any alteration found necessary under abnormal conditions and to increases in postage rates.

* *Foreign subscriptions must be remitted in British currency.*

CONTENTS



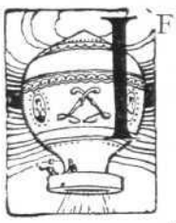
**DIARY OF FORTHCOMING EVENTS**

*Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in the following list:—*

1926

| | |
|---|---|
| June 28 .... | Air League of the British Empire Annual General Meeting. |
| June 26–28 | Aerial Rally at Ostende. |
| July 2 .... | R.A.F. Dinner Club Annual Dinner, at Connaught Rooms. |
| July 3 .... | Royal Air Force Display, Hendon. |
| July 3 .... | Second R.A.F. Iraq Dinner, Hotel Cecil. |
| July 8–24 .... | Royal Tournament, Olympia |
| July 9–10 .... | King's Cup Race, Hendon. |
| July 11–27.... | German Seaplane Competition at Warnemunde. |
| July 19–Aug. 7 | French Competition for Multi-engined Seaplanes, St. Raphael-Frejus. |
| Aug. 9-15 .... | French Light 'Plane Competition. |
| Sept. 10-17 | Two-Seater Light Aeroplane Competition, Lympne. |
| Sept. 18 .... | Grosvenor Challenge Cup, at Lympne. |
| Oct. .... | Schneider Cup Race at Norfolk, Virginia, U.S.A. |
| Nov.–Dec. .... | Paris Aero Show. |

# EDITORIAL COMMENT.



"IF I were asked to say in a single sentence what should be the three main lines of progress, I should say an air route to India in four days, an air route to Australia in ten and New Zealand in twelve days, and an air route to Cape Town in six days." This statement, made by Sir Samuel Hoare, Secretary of State for Air, at the luncheon given by the British Empire League last week, may be taken to summarise the policy of the Air Ministry, or rather the Cabinet, in the matter of Empire aviation in the near future. Sir Samuel Hoare has a habit of speaking in very moderate terms when he is dealing with the future and at the luncheon he dealt, not with remote possibilities, but with what we know to be technically possible at once, provided the necessary financial support can be secured. When, therefore, Sir Samuel stated it as his view that the three trunk routes mentioned by him should be the three main lines of progress, we may accept it that he has made sure of his ground. His statement is, accordingly, a very welcome indication of the determination of the Government to attack the problem of air communications on an Imperial basis, the only basis, in our opinion, upon which a sound and really useful air line system can be built up if it is to be more than a camouflage for military objectives. By way of explaining what is being done to carry the Government's policy into effect, Sir Samuel recalled the work being done on the Cairo-Karachi route, which, he said, would be in operation for the carriage of passengers and goods not later than January of next year. The Air Minister made the interesting statement that already officers on the North-West frontier and Indian civilians, are booking passages on this air route, which will save them a week at each end of their leave. This may seem a small matter, but is really much more significant than might appear at first sight, proving as it does that, once a route is established which gives a real saving in time, there will always be a large number of people willing to pay the slightly higher fare. It was, we

**Empire Aviation**

believe, Sir Alan Anderson, the well-known ship owner, who said, during a discussion at the Royal Aeronautical Society, that the fares contemplated were too low. With the saving in time which air travel over long distances offered, the question of fares was insignificant, and instead of apologising for having to charge more than first-class fare, they could charge several times first-class fare and still obtain plenty of passengers. He quoted as an instance his own case. Owing to the long time spent in travelling by ordinary means, it was twenty years since he visited Australia. If an air service were in existence that would carry him to Australia in ten days or a fortnight he would visit Australia every year. It has been proved that the technical obstacles to be overcome are within solution, even with present knowledge. It seems fairly certain that the traffic would be forthcoming. The final organisation of a portion of the route is progressing, and as far as can humanly be foreseen, all that is necessary for success is assured and continued financial support in the early stages. On this subject Sir Samuel touched upon a point of the very greatest importance. He pleaded for support from the Dominions and Crown Colonies in the matter of establishing and maintaining landing grounds as links in the Empire chain. This subject is one which will, we hope, be taken up very seriously, at the forthcoming Imperial Conference to be held in October. No better form of co-operation could be imagined than for the outlying portions of the Empire to provide aerodromes and accommodation. The Mother Country will be prepared to supply the flying stock, and to undertake the research work necessary, but it is essential that the Dominions should look after the aerodromes. Moreover, it is not only essential but it is entirely logical. The aerodromes are the harbours of an air service, and no Dominion would expect us to send out ships with cargo and passengers, unless suitable harbours existed for the loading and unloading of passengers and goods.

We have said that it is logical for the Dominions to maintain their chains of aerodromes. It is equally logical, and very desirable, that over such portions of an Empire air route as lie within the Dominions most, if not all, of the flying personnel should be recruited from the Dominion in question, and we would urge that this subject be also given due consideration.

In his speech Sir Samuel Hoare said that he was convinced that when once the Cairo–Karachi section was running regularly, the demand would be irresistible for linking Egypt up with England at the one end, and Karachi with Bombay, Calcutta, Rangoon, and Singapore at the other end. Very well. The great thing, then, is to make a start with the Cairo–Karachi section, and we have the assurance that this will be in operation by January next.

Concerning the air route to Cape Town in six days, Sir Samuel referred to the recent flight of the R.A.F. squadron, and to Mr. Alan Cobham's flight to the Cape and back. These flights were possible only by reason of the policy of the Government to organise landing grounds which enabled squadrons to move quickly from one part of the Empire to another. Thus once more the importance of aerodromes is brought out.

The Air Minister also referred to the possibility, somewhat later, of an air route across the Atlantic to Canada in two and a half days, but this was rather more difficult. Sir Samuel spoke at some length on the subject of airships, and it may be assumed that he visualised the route to Canada as an airship route. He made the interesting statement that the actual constructional work on the new large airships would be begun in the early autumn, and that in Egypt and at Karachi the work on the bases was progressing satisfactorily. Personally we are somewhat doubtful concerning these giant airships, which will represent a rather bold departure both in the form of construction and in the sizes contemplated. However, it is reassuring that the Air Minister does not make the mistake of underrating the difficulties of the problem, to which, as a matter of fact, he referred as "the great adventure upon which we are engaged." That is a healthy sign, and, provided we do not fall into the grave error of being too sure of ourselves, there may be a good chance of success. In connection with airship routes, Sir Samuel pleaded for assistance from the Dominions in the matter of mooring masts, and what has been said above regarding aerodromes applies equally to mooring masts, which are the harbours of airships in the same manner as the great hangars are the docks for airships.

Altogether the Air Minister's speech was full of promise for the future, and, as he was speaking to a number of very influential people, it is not, perhaps, too much to hope that his speech will prove to have done a great deal of good in helping towards a fuller realisation of the vital importance to the British Empire of air communications.

◈ ◈ ◈ ◈

**Thoret Flies over Alps**

IN spite of very unfavourable weather, Lieut. Thoret, the famous French pilot, whose work in connection with gliding on ordinary aeroplanes with engine stopped, both in France and in Northern Africa, is well known, has succeeded in flying across the Alps on a little Albert-Tellier monoplane with 40 h.p. Salmson radial air-cooled engine. Starting from Villacoublay, Lieut. Thoret flew to Geneva, where impossible weather detained him for several days. Once he made an attempt to get through, but had to return. Ultimately, however, he made another start, on June 9, leaving Geneva at 9.20 a.m. and reaching Turin at 12.40 p.m., having flown over the Alps *en route*. The next day he continued on to Milan, covering the distance in 1 hour 25 minutes, in spite of head wind and fogs. While waiting at Milan for the weather in France to improve for the return journey, Thoret made a flip to Venice, the distance of 155 miles being covered in 2 hours 10 minutes.

**D'Oisy Makes a Fresh Start**

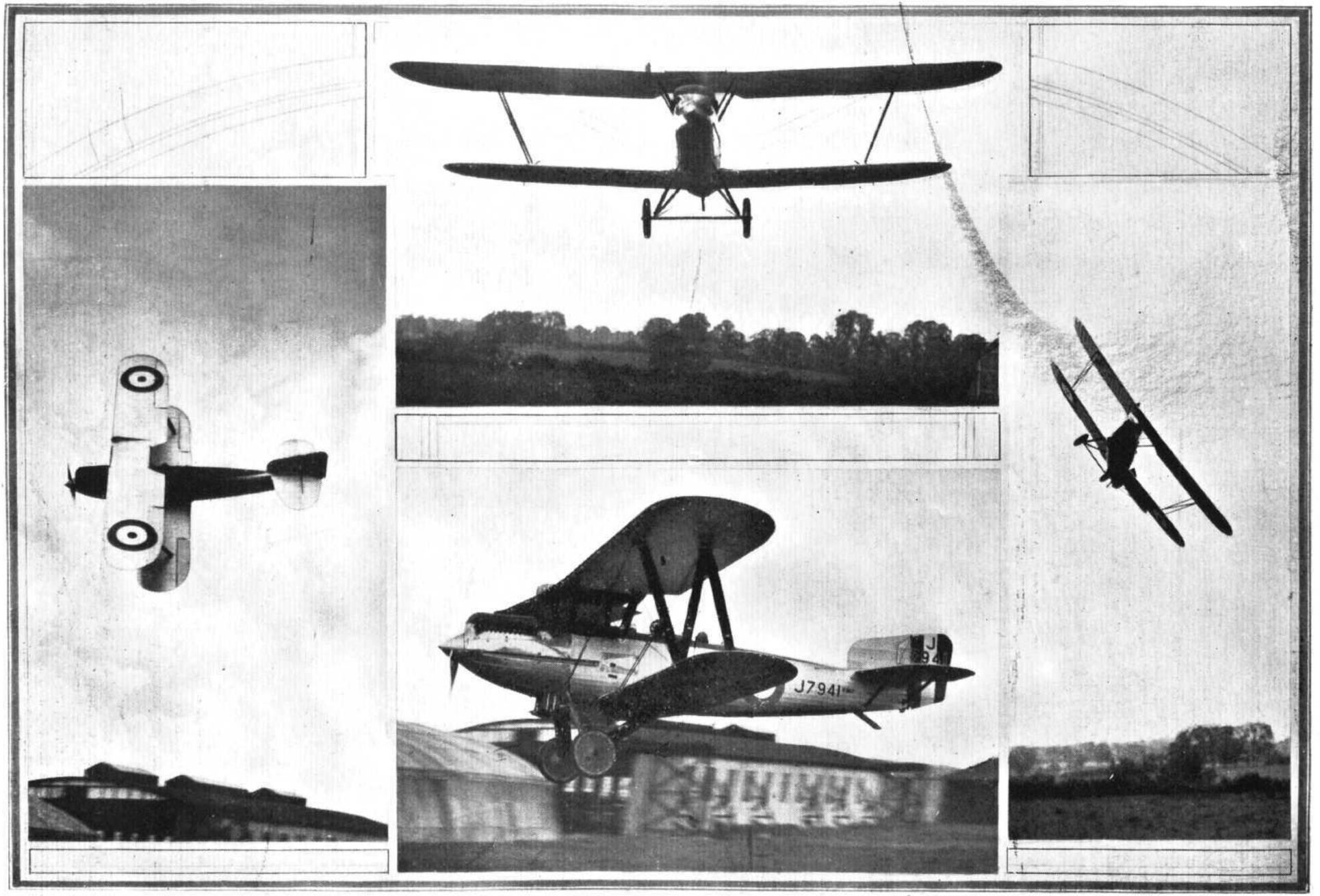
CAPT. PELLETIER D'OISY, and his mechanic Carol, who came to grief at Warsaw in their recent attempt to fly from Paris to Tokyo *via* Siberia, are making a fresh effort. They left Villacoublay—this time on a Breguet type IXX—on June 11, and arrived safely at Warsaw the same afternoon. Proceeding the next day, they flew to Moscow, and completed their third stage to Kazan, on June 13. On June 15 he had reached Irkutsk in Siberia, having thus completed over 4,500 miles in five days!

**A New Italian Airship**

SUCCESSFUL trial flights were carried out at Rome, on June 9, with a new Italian semi-rigid airship, the N3, which has been constructed for the Japanese Navy. This airship is of similar type to the "Norge."

**New R.A.F. Commands**

AIR VICE-MARSHAL SIR GEOFFREY SALMOND will, at the end of the year, relinquish his present appointment as Air Member for Supply and Research to take command of the R.A.F., India—at present held by Air Vice-Marshal Sir Edward Ellington, who will assume the Iraq Command in succession to Air Vice-Marshal Sir John Higgins.




["FLIGHT" *Photographs*

THE FLYING FOX: Four views of the Fairey "Fox" in various aspects. The front view particularly illustrates the small frontal area of this machine. When these photographs were secured the "Fox" was piloted by Captain Norman Macmillan, the Fairey Chief Test Pilot. (See also pp. 348 and 349.)

# THE SUPERMARINE "SWAN" COMMERCIAL FLYING BOAT

## Further Flight Trials at Southampton

ON June 9, some further flying trials were carried out at Southampton with the large twin-engined amphibian flying boat designed some time back by the Supermarine Aviation Works, Ltd., of Southampton. The Supermarine "Swan," the flying boat in question, was actually constructed in 1924 to the order of the Air Ministry for passenger work, and was launched on March 25, 1924, but was not at that time equipped for passenger carrying, and was fitted with two Rolls-Royce "Eagle IX's" (*see* FLIGHT, April 10, 1924).

Shortly after the "Swan" went to Felixstowe for its official trials, which proved so satisfactory that the Air Ministry decided that, with certain modifications, it would make an efficient Service machine. Mr. Mitchell, its designer, therefore, set to work in re-designing the "Swan" to suit Service requirements, and eventually evolved the "Southampton," which is now one of the standard machines of the R.A.F.

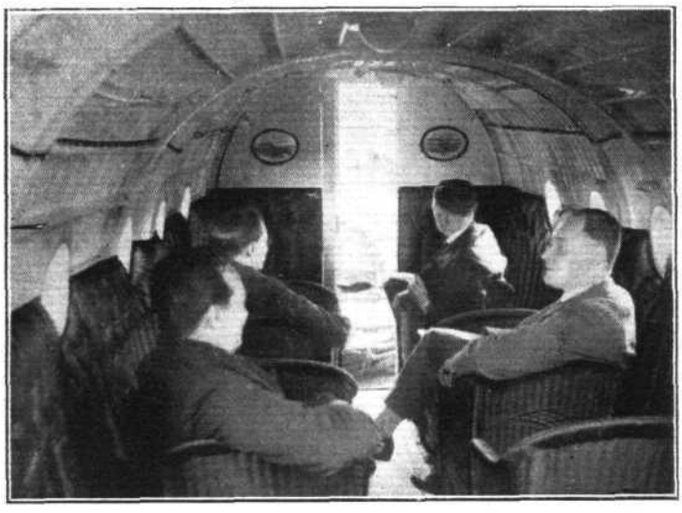
In the meantime, the "Swan" went back to Southampton, and in due course was fitted out for the work for which it was originally intended—passenger-carrying for civil air lines. This work has recently been completed and, as previously stated, practical flying tests carried out.

In its present form the "Swan" is fitted with two Napier "Lion" engines, whilst the cabin equipment, &c., presents several noteworthy features. The passengers' cabin is located in the hull, and is exceptionally roomy and conveniently laid out. Accommodation is provided for ten passengers, who are seated in comfortable wicker arm-chairs. These are arranged on either side of the cabin, leaving a small gangway in between. Beside each seat is a porthole in the wall of the cabin, through which the passenger has an excellent view of the sea-scape below.

Forward of the cabin is a compartment for luggage, &c., access to which is by means of a door leading directly into the cabin and via a hatchway from the deck. Aft of the cabin there is lavatory accommodation.

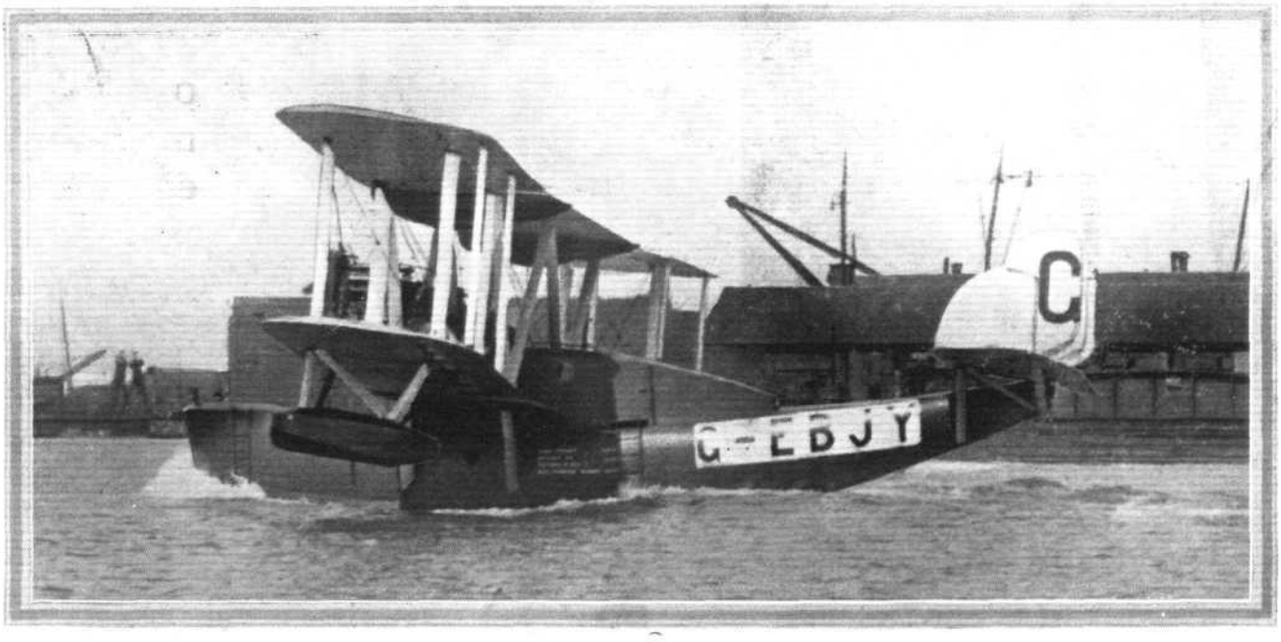
The interior of the cabin generally is bright and pleasing, the upper arched portion being given a light finish and is adorned with framed aviation pictures, while the lower portion has padded upholstery.

whilst the pilot, Capt. H. C. Biard, was accompanied by Capt. F. J. Bailey, manager of the Woolston airport. After taxying to a favourable position opposite the Government Rolling Mills, the "Swan" took off in a comparatively short run and headed down Southampton Water to Hamble River, then turned back towards the docks. Flying



**An interior view of the passengers' c bin of the Supermarine "Swan." Seating accommodation is provided for ten passengers.**

at altitudes varying fron 100 to 1,200 ft., the "Swan" made two trips to Lee-on-Solent, during which two perfect landings were made. After about an hour's flying, the "Swan" returned to its nest, having given a very satisfactory account of itself.

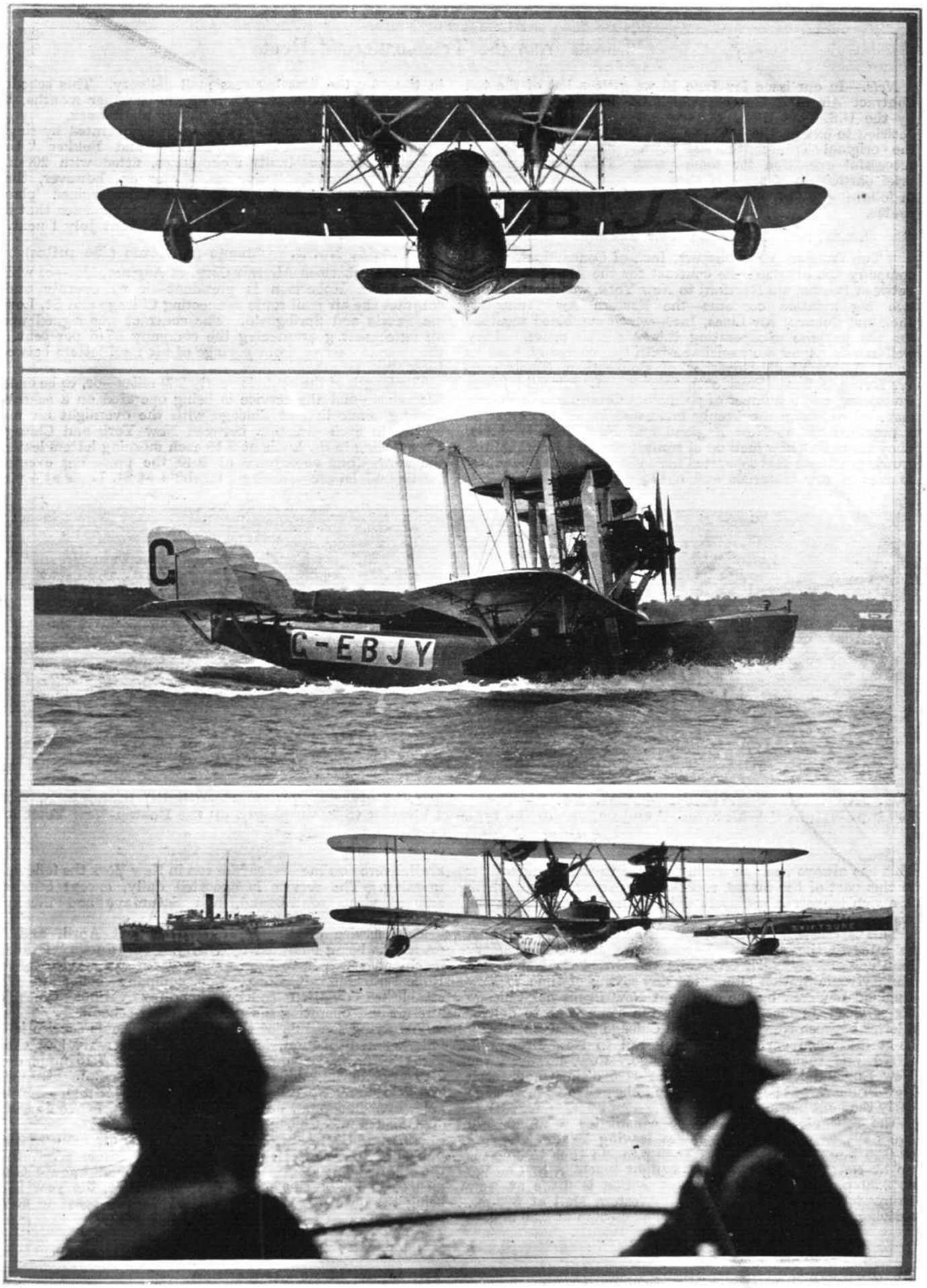



**THE SUPERMARINE "SWAN" COMMERCIAL FLYING BOAT: This view shows the "deck-cabin," above the main passenger cabin, which forms the business quarters of the machine. It houses the pilot, navigation, and all controls.**

Pilot and navigator are accommodated in a separate cockpit or "cabin" located on the top of the hull, between the main planes. All the controls are located at this point. The engines are mounted, as usual, on either side of the control cabin midway between the top and bottom planes, and each drives a four-bladed tractor air screw.

On the occasion of its recent flying test the "Swan" carried its full complement of passengers, made up of eight young ladies employed at the Supermarine Works, a representative of Imperial Airways, and a member of the Press,

It may be of interest to note in conclusion that news has just been received by the Supermarine Aviation Works, Ltd., from their chief designer, Mr. Mitchell, who is in Copenhagen, that a contract has been signed with the Danish Government for a large three-engined flying boat. This machine will be built at the Supermarine Company's Southampton Works, and will be fitted with three "Jaguar" air-cooled engines manufactured by Messrs. Armstrong, Siddeley, Ltd. It is worthy of note that this contract has been secured in the face of strong continental competition.




THE SUPERMARINE "SWAN" COMMERCIAL FLYING BOAT: Three views of the twin-engined (Napier "Lion") passenger air liner, taken on the occasion of its recent flying tests at Southampton. (See page 344.)

# U.S. AIR MAIL SERVICES

## Offshoots from the Transcontinental Route

*Note.*—In our issue for June 10 we gave a list of the ten Contract Air Mail Services which have been entered into by the U.S. Post Office Department, consequent upon the decision to extend the U.S. Air Mail Services beyond that of the original Transcontinental route, which has been in successful operation for some years. This week we give brief particulars of some of these new C.A.M. Services, and in following issues we will continue our reports on the other routes.

### C.A.M. No. 1.—Boston-New York (200 miles)

THE Colonial Air Transport, Inc., of Connecticut, which company has obtained the contract for the Air Mail service between Boston, *via* Hartford to New York, was formed from two big aviation concerns—the Eastern Air Transport, Inc., and Colonial Air Lines, Inc.—which combined together for the purpose of operating this Air Mail route. Many well-known names are associated with this company, such as John H. Trumbull, Governor of Connecticut (Chairman), W. Irving Bullard (President), Sherman M. Fairchild (Vice-President), and a number of prominent Connecticut business-men, all of whom are keenly interested in air transport as a practical aid to New England and New York business. They see in this new method of transport a way to bridge the growing distance that separated their various plants from their sources of raw materials and outlet markets to the West. This has always been an acute problem to the manufacturer in this part of the States, especially in New England, which is a rich industrial peninsula more or less isolated from the rest of the States.

This new service, therefore, will mean much to New England, as hitherto the poor train connections and the necessary haul across New York City from the Grand Central to the Pennsylvania Station eliminated any saving of time to New England rendered by the overnight New Brunswick-Chicago air service; in fact, it took just the same time to deliver a letter between New England and Chicago by rail *via* Albany as it did when carried partly by rail to New Brunswick (N.J.), and thence by air to Chicago. Now, however, the New England letter can be mailed at 5 o'clock and reach New Brunswick at 9 o'clock, in time to be delivered in Chicago early the next morning.

The schedule for this service constitutes a round trip five days a week, the machines leaving Boston air port at 6.30 p.m., and Hartford at 7.45 p.m., in time to connect up at New Brunswick with the night machine to Chicago at 9.30 p.m. On the return, connection is made at New Brunswick with the Chicago and Western Mail at 6 a.m., arriving at Hartford at 7.30 a.m. and Boston at 8.30 a.m.—in time for the first business mail delivery. This schedule permits of daylight flying during the summer months, the remaining eight months being entirely night work.

To commence with, the service will be operated by single-engined machines—Curtiss "Larks" and Fokker "Universal" (American-built) monoplanes, fitted with 200-h.p. Wright "Whirlwind" engines. Later on, however, these machines will be replaced by large three-engined 'planes equipped with Wright J-4 B engines. It is expected that the service will commence operations on or about July 1 next.

### C.A.M. No. 2. Chicago-St. Louis (280 miles)

THE Robertson Aircraft Corp. of Anglum, Mo.—of which William B. Robertson is president—is to operate under contract the air mail route connecting Chicago and St. Louis, *via* Peoria and Springfield. The contract was signed upon an agreement guaranteeing the company 67·5 per cent. of the income derived from postage of air mail letters between these two points.

The length of the route is nearly 280 miles—or, to be exact, 278 miles—and the service is being operated on a schedule making connection at Chicago with the overnight air mail service in each direction between New York and Chicago, thus placing in St. Louis at 9.15 each morning letters leaving the New York aerodrome at 9.40 the preceding evening. Eastbound letters catching a machine at St. Louis at 4 p.m. are delivered on the first carrier run in New York the following morning. The service is operated daily, except Sundays and Mondays southbound, and Saturdays and Sundays northbound.

This service commenced operations last April, and at present is being operated by D.H.J.-4 and Curtis "Oriole" machines, which have been equipped for the service by the Robertson Aircraft Corp., this company being an old-established aviation concern handling various types of aircraft and operating a successful flying school.

The flying schedule of the Chicago-St. Louis service is as follows: Southbound, leave Chicago upon arrival of overnight 'plane from New York. Peoria, arr. 7.15 a.m., dep. 7.25 a.m. Springfield, arr. 8.5 a.m., dep. 8.15 a.m. St. Louis, arr. 9.15 a.m. Northbound, leave St. Louis 4 p.m. Springfield, arr. 4.55 p.m., dep. 5.5. p.m. Peoria, arr. 5.45 p.m., dep. 5.55 p.m. Chicago, arr. 7.15 p.m.

**A Correction.**—In our article on these air mail services published in FLIGHT for June 10 we stated, in error, that the night-flying section of the transcontinental route commenced in 1920; this should have read 1924, the year 1920 being the date of the completion of the full coast to coast route.


**U.S. AIR MAIL SERVICES. C.A.M. No. 1.—The Fokker "Universal" (American-built) monoplane, with 200 h.p. Wright "Whirlwind" engine, one of the types of aircraft to be employed on the Boston-New York Air Mail Route.**

### R.A.F. Cairo-Cape-Cairo Flight

THE four Fairey IIID's (Napier "Lion"), now seaplanes, under Wing-Commander Pulford, which are on their way to England after their successful flight from Cairo to Cape Town and back, reached Naples on June 14.

### The Light 'Plane Competition

INTENDING Competitors are reminded that the entries for the above competition close on June 30. The entry fee is £10. Late entries will, however, be received up to July 31, but the late entry fee is £30.

FLIGHT

# SIR SAMUEL HOARE ON EMPIRE AIR ROUTES

## Air Minister's Speech at British Empire League Luncheon

SIR SAMUEL HOARE, Secretary of State for Air, speaking at a luncheon given in his honour by the British Empire League, on June 11, made a strong appeal on behalf of the future of British and Empire flying. As his remarks were addressed to a company that included—apart from many directly connected with aviation—a number of official representatives of some of the Dominions, who were in a position to give practical aid, it is to be hoped that his appeal and suggestions will not pass unheeded.

Sir Samuel laid before his hearers, first a review of the present position of British aviation, showing that sound progress had been made upon which, with the backing of the Empire Governments and the Empire peoples we could make greater and swift advances in the future. Then he turned from the past to the possibilities of the near future.

If, he said, he were asked to say in a single sentence what should be the three main lines of progress, he would say, air routes to India in four days, to Australia in ten days and New Zealand in twelve days, and to Cape Town in six days—and possibly a fourth across the Atlantic to Canada in 2½ days. When once these were running, smaller lines would, no doubt, radiate from them, linking up with them the territories of this or that Crown Colony or Dependency.

He next outlined the steps that were being taken to carry this policy into effect, referring to the organising of landing grounds at various points, the R.A.F. Cairo-Cape Flight, and the passenger and mail service between Cairo and Karachi, starting next January. Here again, once this service got going he thought there would be a demand for linking it up, at one end with England, and at the other end with Bombay, Calcutta, Rangoon and Singapore. Sir Samuel then dealt with the proposed commercial air lines by airships. In this connection he believed that with sustained effort, the airship could be made a useful weapon of Empire defence and an invaluable instrument of Imperial unity. As regards the progress being made with this airship programme, Sir Samuel said that they were beginning to see the results of the research and experiments they had been making with the R.33, fabrics, metals, heavy oil engines, and the special meteorological study; the designs of the two airships were practically complete and construction had commenced. Good progress was also being made with the Egyptian base and the station at Karachi.

Definite progress was thus being made, said Sir Samuel, but to carry it to success, we needed not only the help of the man of science, the engineer and the operator, but we needed also the active support of the great Dominions. He therefore wished to make a suggestion to the Governments and peoples of the Empire. Would it be possible for the various governments in their own interests no less than in the interests of Empire communications, each to build a mast that would take these airships, enabling them to fly to South Africa, Australia and New Zealand? The expenditure would not be great, and if it were undertaken without delay, would enable us to make full use of our two airships as soon as they were built. We now had a unique opportunity of leading the world, both in the construction and operation of airships. Let us, said Sir Samuel, make the most of this opportunity. Let us press on cautiously and steadfastly with a programme that, if it were successful, might bring inestimable benefit to the whole Empire, and let us make use of the misfortunes of the past, not for the purpose of throwing doubt upon the prospects of the future, but rather for the purpose of availing ourselves of the lessons that they taught.

---

Following Sir Samuel Hoare's speech, reported above, it is of interest to note that it is reported that Mr. Bruce, Premier of the Commonwealth of Australia, made the following statement in Melbourne on Monday:—"If the project (the air route to Australia) is proceeded with there will be no difficulty in erecting suitable mooring masts in Australia. No official communication in the matter has reached the Government, who will take all the necessary steps when requested to act."

### Two Italian International Competitions

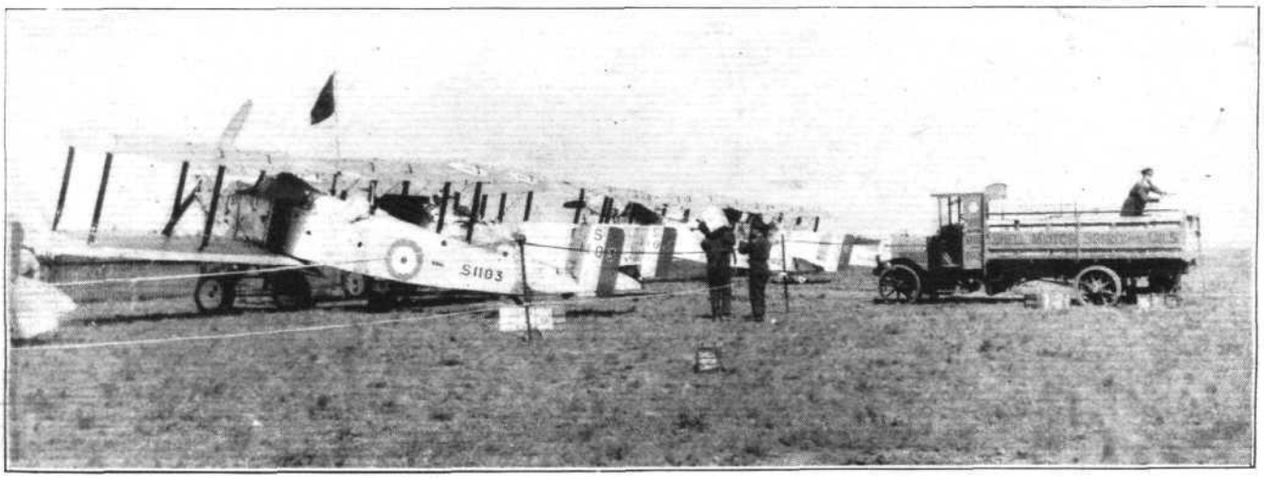
Two Italian international aero competitions are announced to take place next autumn. These are (1) the "Coppa del Mare," for touring and training seaplanes (October 24-28), and (2) the "Coppa d' Italia," for touring and training aeroplanes (November 11–15). Both are open to all machines entered by an aero club affiliated to the F.A.I. In the aeroplane competition the machines must conform to the following conditions: biplane with dual control, engine 40 to 90 h.p., useful load 386 lbs., and fuel for 156 miles. The circuit will be 250 kms. (156 miles), to be flown without landing. The conditions for the second competition are: fuselage biplane with dual control, engine 40 to 90 h.p., useful load 386 lbs., and fuel for 186 miles. In each case the first prize is 150,000 lire, and the second prize 50,000 lire.

### Italian Air Lines

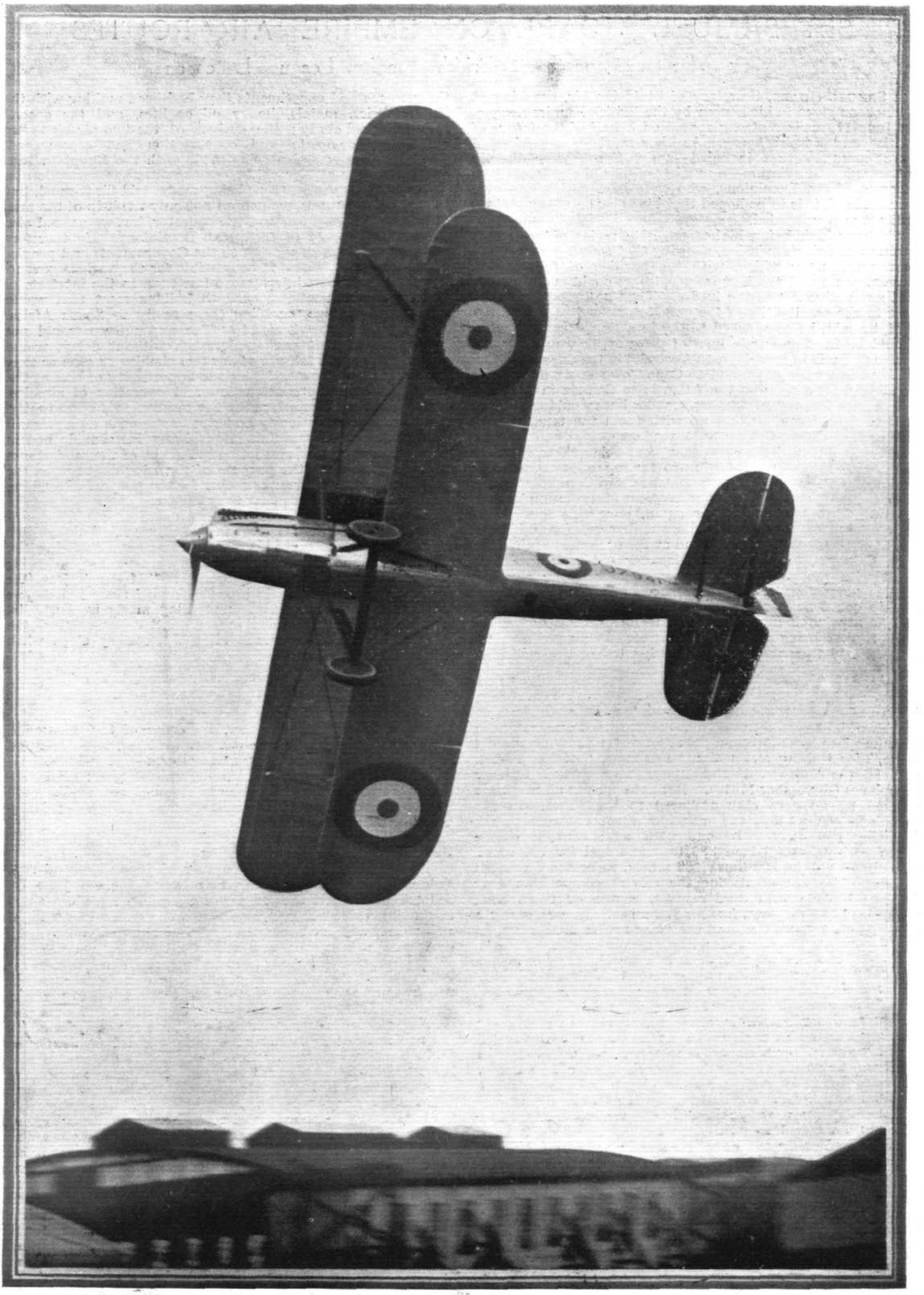
THE Italian Air Ministry, by order of Sig. Mussolini, are planning a series of international air lines, to be operated by Italian pilots and machines, as follows:—Milan-Innsbrück-Munich; Milan-Brindisi-Candia-Cyrenica-Egypt; Brindisi-Athens-Constantinople; Brindisi-Rome-Barcelona-Tangier; Brindisi-Vellona; Trieste-Vienna-Budapest-Belgrade; Italy-Tripoli-Tunis.

### Japanese Prince's First Flight

PRINCE CHICHIBU, the Emperor of Japan's second son, made his first aeroplane flight at Stag Lane, on June 12. Piloted by Colonel the Master of Sempill, he made a short flight in a D.H. "Moth," and then was given a longer flight in another and more powerful type of D.H. machine.

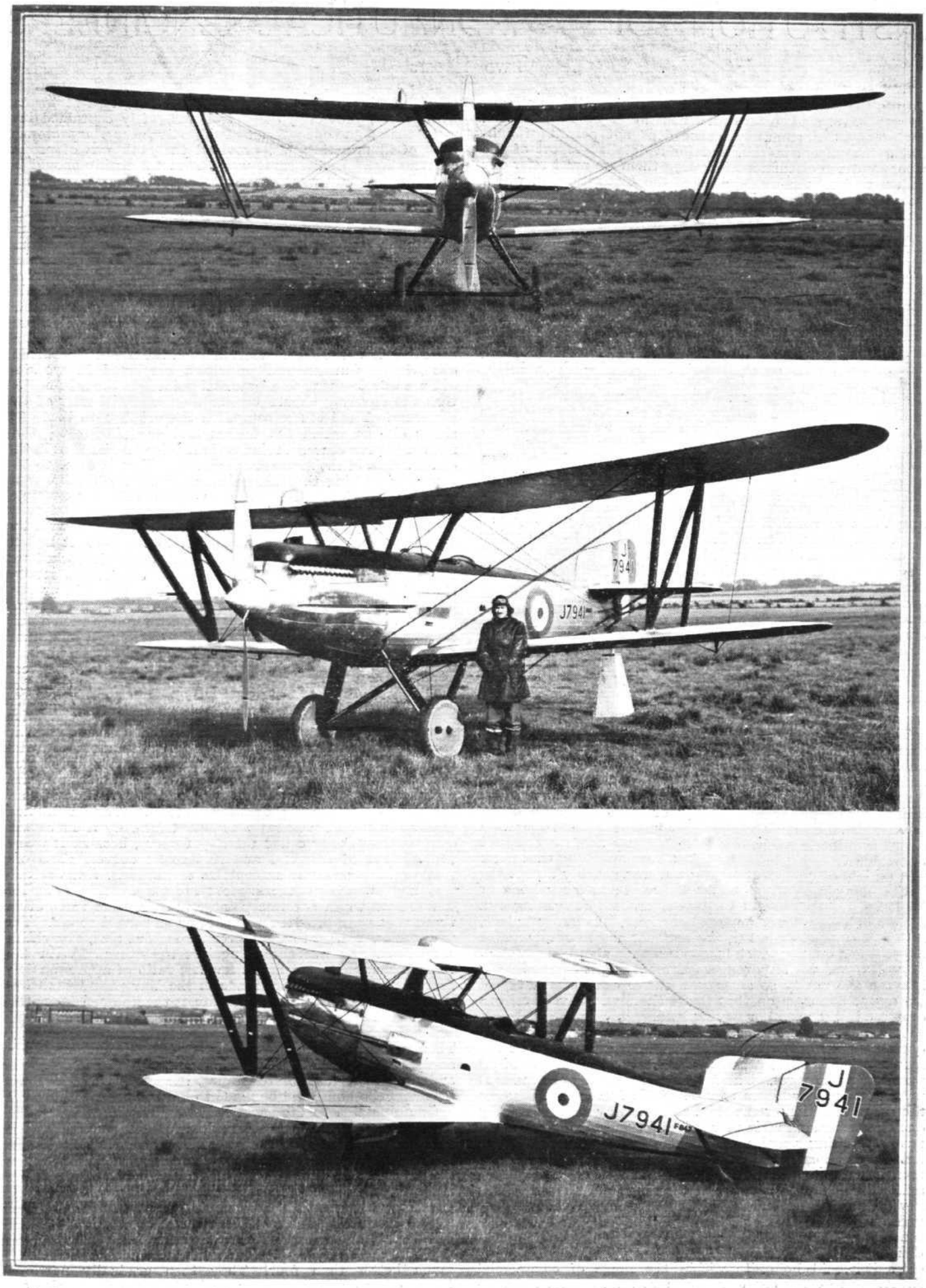



**THE R.A.F. CAIRO-CAPE-CAIRO FLIGHT: This photograph shows the four Fairey machines with Napier "Lion" engines being refuelled with "Shell" at Johannesburg.**



["FLIGHT" *Photograph*

**"THROWING IT ABOUT": Captain Norman Macmillan making a nearly-vertical turn at low altitude on the Fairey "Fox." (See also pp. 343 and 349.)**




["FLIGHT" *Photographs*

R = KSV²: These three views of the Fairey "Fox," with Fairey "Felix" engine, give an excellent idea of Mr. Fairey's interpretation of the fundamental formula quoted at the beginning of this inscription. In the case of the "Fox," S is certainly small, K is probably very small, with the result that R is also small, and V quite perceptible. (See also pp. 343 and 348.)

# INSTITUTION OF AERONAUTICAL ENGINEERS

## Two Papers

DURING the last few weeks two papers of more than ordinary interest were read before the Institution of Aeronautical Engineers. Unfortunately, space does not permit of publishing the papers in full, and for a detailed report of the papers and the discussions following them we must refer our readers to forthcoming Minutes of the Institution, in which the papers and discussions will be published in full.

### METAL-CLAD AIRSHIPS

On June 4 Mr. Ralph H. Upson, M.S.A.E., of Detroit, gave a lecture on "Recent Progress in the Development of Metal-Clad Rigid Airships." Colonel J. T. C. Moore Brabazon, M.C., M.P., was in the chair.

The Chairman said that Mr. Upson, general manager of the Aircraft Development Corporation of Detroit, was a bird of passage this time, as he only had a very few days in London. Mr. Upson would tell them of some of the new developments which were taking place with regard to airships. Some of them divided themselves into two camps over aeroplanes and airships, but if airships were a luxury in some countries, in the opinion of the Chairman they were a necessity to an empire like the British, where long distances had to be tackled and big weights and large bales carried very long distances.

Mr. Ralph Upson said he regretted that his talk had been variously termed a lecture and a paper. He thought these were possibly too dignified terms for the informal talk which he proposed to give. He had heard certain criticisms of the length of time which it had taken for Great Britain to get at the actual construction of the large airships. In order that no one might be discouraged, he would say that the Aircraft Development Corporation in Detroit had been working for five years on one problem only, that of making better airships, and they had only now reached a point where they were ready to begin construction on a very small demonstration unit. The company was actually organised for the purpose of developing a type of airship which should be thoroughly safe and economical for commercial purposes. The main object of the whole development was improvement in the fireproof qualities of the structure.

#### Helium *v.* Hydrogen

There was, the lecturer said, a good deal of misconception as to the situation in the United States with respect to helium. Many people seemed to think that in America they had large quantities of helium. That was far from being the case, and they were still very far from having a supply of helium which either in quantity or price could be called commercial. By improvements in construction and operation it was possible to use helium in such a way that it would not be wasted to any great extent, but even assuming that there was no loss of helium at all, that it cost nothing except the initial filling, and without allowing anything for valving or for leaks, there were still very considerable disadvantages in the use of helium for commercial purposes. In the first place, helium was deficient in lift, and so far it had been impossible to get it in a quality which lifted more than about 90 per cent. of good commercial hydrogen. Later it might be possible to increase the purity so as to get 92 per cent. of the lift of hydrogen, but even on that figure there was a very serious decrease in the useful or paying load.

Turning to the subject of hydrogen, the lecturer pointed out that the fact that hydrogen will burn, furnished at the same time one of its principal disadvantages and one of its principal advantages. The fact that it would burn made it possible to use hydrogen as part of the fuel and so increase the range of action of the ship. In one way that was really one of the factors making for safety, because it increased the reserve cruising range, not only on account of the extra fuel that could be carried, but on account of the gas itself being useful for fuel. Putting everything together, one got as a final result that with a ship of the range and size which was now contemplated, if they wanted to make the greatest possible distance they could attain just about double the distance with hydrogen that would be possible with helium at equal speed. Worked out on a basis of paying load in many cases it would be quite within the range of commercial feasibility to carry considerably more than double the payload with hydrogen than with helium. For commercial purposes therefore they were not at all ready to scrap hydrogen. One of the main desirable features they wanted to work out was to get an airship which was sufficiently fireproof in its own structure to make it as safe with hydrogen as with helium. One was not afraid to ride in a motor car with petrol, providing the petrol was safely contained in a metal tank; and one was not afraid to live near a large storage tank of illuminating gas, provided the tank was of proper construction. In the same way the metal airship should be to all intents and purposes perfectly safe for ordinary commercial use, whether used with hydrogen or helium.

Turning to the question of how to get such an airship, Mr. Upson said it was fairly clear before they went very far that Duralumin had very good qualifications. It was true that Duralumin corroded to a certain extent, but they were learning several practical ways to protect it. As long as the surface was protected they knew that Duralumin was of indefinite life. Fabric on the other hand, was affected by the actinic rays striking through any protective dope or varnish preparation, and the rays deteriorated not only the covering but the fabric itself. Having decided upon the use of Duralumin, one of the fundamental principles employed in working out the development to a practical point was the assumption that the covering should be made an essential part of the structure. The lecturer compared the problem to that of a steamship, in which the frames and the plating together formed the structure. A similar principle was aimed at in the construction of the metal-clad airship. When it came to the means of putting this theory into practical form, there were considerable difficulties. It was very difficult, for example, to get for the smaller sizes or even for moderate sizes of airship a gauge of material thin enough to compare with the plating of a steamship in proportion to the loads it had to carry. As a matter of fact on simple proportion it worked out as an almost prohibitively thin skin. Thus for the smaller sizes at least it became necessary to allow a certain proportion of the weight for mere covering purposes. This requirement necessitated a re-design of the entire hull in such a way that the amount of surface would be reduced to a minimum. At the time when Mr. Upson's corporation began work, it was usual for rigid airships to have a fineness ratio of between 8 and 10. That of the "Shenandoah" was 8·7 and the "Los Angeles" had a fineness ratio of approximately 7·2. Mr. Upson had an idea as had also certain other people, that with a proper design of curve it would be possible to make an airship efficient which was very much shorter and more compact than that. Just about this time the thick section wing began to come into favour for aeroplanes, and some astonishing results were being obtained, so that just by analogy they estimated that they ought to be able to design an airship hull with as low a fineness ratio as 3½. Gradually a curve was evolved which they called the E—H curve, because it was a combination of elliptical and hyperbolic curves. The one part of the curve not susceptible to analysis, *i.e.*, the tail, was made in several differing forms of varying fineness. One was carried to an extreme point, and there were three other types that were progressively shorter and more round. The tail which was next to the shortest came out best, everything considered, and was chosen against the others. With this tail the shape evolved had a fineness ratio of approximately 2·8. The first tests were made in the Navy wind tunnel at Washington. According to these tests the hull resistance was approximately one-half of that of the "Shenandoah" hull, which had a fineness ratio of approximately three times greater. There was some doubt as to whether this figure could be accepted as reliable, but even if another 100 per cent. were added to the figure for resistance, it seemed that the lower fineness ratio hull could be made to have a low resistance.

One objection to the short hull was that it was unstable. From fundamental considerations it appeared entirely reasonable to suppose that a ship of this kind could be stabilised satisfactorily, and by means of a close study of the proportions, dimensions and arrangement they had been able not only to get satisfactory stability and control, but to effect a very great improvement over anything that had appeared up to that time. They made three different styles of fin surfaces to start with, and eliminated one factor very early in the study by discovering that eight fins were very much better than four. They then gradually narrowed the problem down until they finally had the shape, size and position both circumferentially and longitudinally that gave a very close approach to the absolute maximum of efficiency. Thus by the one means of discarding the old type of fins and re-arranging them, they obtained a ship which was not only not unstable, but which was particularly good as regards

stability. In the same way that the frames and the plating co-operated structurally, the fins and the hull co-operated aerodynamically.

Having determined that the short compact shape of hull could be satisfactorily used, one problem was out of the way. The short fineness ratio made it possible to build not only a large airship of the metal-clad type, but an extremely small one. Mr. Upson stated that the demonstration airship which they were building first was to be one of only 200,000 cubic feet, or the same size as the fabric non-rigids being operated by the United States Army at the present time. The new airship would, however, not only be a rigid but a metal-clad rigid.

Coming to the structural part of the design, Mr. Upson said that at first it was considered by many almost impossible to calculate the stresses arising in a metal-clad airship. In the Zeppelin type of airship there was a very high degree of redundancy. Offhand, one would say that nothing could be more redundant than a metal-clad airship. Strangely enough, however, the approach to the extreme in that respect had been in effect a simplification. There were two ways to simplify a structure from the stress analysis point of view; one was to reduce the number of elements to the minimum which made a statically determinate structure out of it. The other was to multiply them so much that in effect they produced a uniform material. In other words, if the number of parts was increased to such an extent that the material to a large extent closed in on itself and became perfectly uniform, so that the stresses could be carried in any direction, then one could go back to first principles and consider in what direction that stress was going to be carried. It was no child's play to work out the stresses over the whole of the metal-clad airship hull. The undertaking was a very arduous and difficult one, but it was susceptible to very close analysis.

The stresses in the actual airship were first worked out by purely analytical methods. Then to be thoroughly on the safe side they repeated the same kind of experiments as had been made for aerodynamic purposes. The lecturer then described and illustrated how tests were made on what is known as a water-model, which is, fundamentally, simply a scale model made out of some kind of material, everything in proper proportion, and which is then suspended upside down and filled with water. The weight of the water is a volume factor in the same way as is the lift of the gas, and so the water-model enabled tests to be made on the structure of the airship as a whole. Mr. Upson pointed out that in water-model tests it is usual to choose the size of the water-model as one-thirtieth of the linear dimensions of the full-sized airship. In order to simulate over-loading in the same way that an aeroplane wing is tested to destruction by sand loading, they chose a different size of water-model, which was approximately one-fourteenth instead of one-thirtieth. By using this larger water-model and keeping the material the same that would be used on the full-sized airship, they got the equivalent of over-loading the airship approximately five times, which was severe enough to give a good big load factor. At the same time, it accomplished another incidental purpose of practically eliminating any effect of the stiffness of the material, which was almost nothing on the full-sized ship.

The principal result of the exhaustive water-model tests, which covered a period of about five months, during which the model was inflated most of the time, was that they could not tell any difference between calculated results and the results of the water-model tests. At one time it was thought they had found a place where the two methods did not check. A series of small wrinkles were discovered which indicated excessive shear stress at one portion of the model. The calculated stress analysis had not indicated these stresses, and it was thought at first that somehow the calculations had gone wrong. It was later found, however, that the cause was that in the stress analysis they had not taken the stresses at a sufficient number of different points.

As already indicated, the airship was designed as a rigid structure at all times, that is, it was entirely non-deformable, which was one of the main essentials for a metal-clad hull, and it would be far more rigid than the rigid airships of the present day. That still left two problems to be taken care of. One of them was the stiffening of the surface locally against wind pressures and tendencies to vibrate. The other was to utilise the strength of the plating to as great an extent as possible in unusual weather conditions, such as those which destroyed the "Shenandoah." The manner in which these two problems have been solved was indicated by the lecturer by means of diagrams, without which it is almost impossible to convey an idea of how this result is achieved. It may be said, however, that by a suitable choice of curves, etc., as the speed increases and more local support for the plating is required, the natural flow of the air as induced by the speed itself is such as to re-arrange automatically the pressure distribution in the desired manner.

### The Discussion.

Commander Burney thought there were three fundamental points which had been dealt with by the lecturer. First there was the difference in fineness ratio developed primarily to reduce the area of the outer cover. The results obtained in America were borne out by the work done in this country which had also shown that there was no difficulty in getting down to a very much smaller fineness ratio. He rather agreed with the lecturer when he said that there was very little difference between a fineness ratio of 3 and a ratio up to $4\frac{1}{2}$. Where he did rather disagree with the lecturer was that there were other considerations to be taken into account when dealing with large airships. He quite agreed that on small ships it was feasible to use a small fineness ratio, but in very much larger ships, say of the 5,000,000 cub. feet type, there were other practical considerations, and it was these considerations which led the British experts to choose a $5\frac{1}{2}$ to 1 fineness ratio. He did not think it fair to compare a small metal-clad airship of small fineness ratio with a large Zeppelin type airship of much greater fineness ratio, because obviously there was a very considerable inherent gain in structural efficiency in going to a small length/diameter ratio. The second point to which Commander Burney wished to refer dealt with the metal skin. It would seem that the determining feature of the ship must be the maximum local compressive stress. Therefore it would seem that unless the envelope layers were made up in variations of thicknesses to take such aerodynamic stresses as one got at the tail and the fins, the determining factor would be the local compressive stress in every case. If one considered it upon that basis it would seem that to get the highest efficiency one would begin to crowd the outer cover into such forms and such spaces throughout the ship that one would eventually come back to the type of structure which was termed the Zeppelin type, leaving the cover as a bare cover for reduction of resistance. It would, he thought, appear from a cursory consideration that the metal-clad type of vessel would be heavier in structural weight than a vessel built under normal conditions. At the same time he would not for a moment say that the extra weight might not be justified by increased safety and increased capacity to resist fire and so forth. The third point raised by Commander Burney was that in a type of airship in which one was dependent upon the whole outer surface and on pressure within that outer cover for security it was very difficult to meet conditions such as one had to meet in the normal type of a deflated gas-bag. He would be interested to know how that condition was to be met.

Mr. Upson said he was afraid to put off answering Commander Burney until others had spoken, as he might by then have forgotten some of the queries. He had not expected anyone to draw any unwarranted conclusions as regards comparisons between fineness ratios. He merely intended to bring out certain rather striking facts to show that the short fineness ratio was feasible at least from the standpoint of resistance and stability. The matter of accommodating the fineness ratio to the structure was a different kind of problem. The small and medium sized airships practically demanded a rather low fineness ratio. It was true that from a structural standpoint one could afford, and should have, rather greater fineness ratios for the larger sizes of ships. The bigger the airships became the more serious became the effect of diameter. No matter what the details of the design might be, the diameter had a fundamental effect on the weight, particularly with large sizes. He thought that with airships round 3,000,000 or 4,000,000 cub. feet, one would have to consider the weight of the skin primarily as a structural part of the ship. Anything beyond that would make desirable an increase in fineness ratio.

As regards the point raised by Commander Burney dealing with the subject of weight as influenced by the metal-clad construction, at first they were fully prepared, and considered it would be necessary, to make considerable sacrifices in that direction in order to obtain the other more obvious advantages of the metal construction. The idea at first was that, considering the rather radical nature of the design, they wished to build the first ship about as small as it could be made, and have a satisfactory demonstration with a ship that could be put to some useful purpose. The first guess (Mr. Upson said it was not much more than a guess) at that size was 1,600,000 cub. ft. The design of that ship was worked out to a point where they began to get a fairly good

idea of the weights, and they found, to their surprise, that it was coming out more efficient from the point of view of useful lift than the somewhat larger "Shenandoah." That was as far as they went with that design, because they came to the conclusion that they could probably build a ship with a fair useful lift percentage which would be good for demonstration purposes with a far smaller size. Mr. Upson admitted that the metal by itself added considerable weight in that size of ship. If they had not made improvements in the shape of the hull, in the form and size of the fins, and in various refinements in the structure, they would have been handicapped quite a bit in the extra weight of the covering or plating. Taking everything into consideration, however, it was very favourable. The lightness that had been possible with this small metal-clad airship was surprising in view of the fact that the ship was so much stronger than preceding types. The ship they were building would have a strength or airworthiness at least eight times greater than that of the "Shenandoah." If they were satisfied with an equal strength, the structure could be made very much lighter.

Sqdn.-Ldr. F. A. Baldwin wished to know what form of local strengthening was used in the metal-clad airship.

Mr. Upson said that this was another point which Commander Burney had mentioned regarding compressive stresses. In their calculations they allowed nothing at all for the sheet covering as regards compressive stresses. They assumed that the sheet carried only tensile stresses and shear. The girders were assumed to carry all the compressive load, although there was good reason to believe that under the actual conditions of operation the sheet would carry a very appreciable amount of compressive load. A thin sheet shaped to a double curve would carry quite an appreciable amount of compression.

The Chairman, in thanking Mr. Upson for his talk, said that, having tested most of the methods of getting up into the air, he considered the airship the only gentleman's way of travelling. His own experience in English airships was that one sat in comfort, there was no noise, one rang a bell for anything one wanted to eat or drink, one gazed quietly out on the scenery, and one could talk. That was a thing one was never able to do in an aeroplane, and, after all, on long journeys it was rather tiresome to be almost by oneself. He would like to know from Mr. Upson when this airship was going to be finished. They had all talked about airships for such a long time, and what he wanted was to see the airship in the air. He wished that Mr. Upson would tell them when they thought the American airship was going to be finished, and that Commander Burney would tell them when he thought his airship was going to be finished. They would then be able to leave the meeting looking forward, at any rate, to seeing more airships in the air.

Mr. Upson said he was very sorry that the one question as to when the airship would be finished was the one he was afraid he was unable to answer. They were going on the principle that as long as there was no war going on, or no immediate necessity for this airship, there were things which were a great deal more important than the time to deliver. They wanted to put the quality and safety of the construction first. In other words, he did not like to make any promise of when it would be finished, but he hoped it would be some time next year.

## THE MODERN THEORY OF AEROFOILS AND ITS APPLICATION TO AIRCRAFT DESIGN

ON June 8 Capt. W. H. Sayers read a paper entitled "The Modern Aerofoil Theory and its Application to Aircraft Design." This paper was originally scheduled to be read on May 11, but had to be postponed on account of the general strike. The meeting on June 8 was very poorly attended, possibly as a result of the short interval between this and the previous meeting, at which Mr. Ralph Upson read a paper on metal-clad airships, which latter paper is reported above. The subject which Capt. Sayers had chosen was, it might have been thought, one that would have proved of interest to a large number of members, and the scant attendance was, therefore, all the more surprising.

Mr. Lawrence A. Wingfield was in the chair, and in introducing the lecturer recalled that the paper had been postponed, but that it probably would have lost nothing by the delay; in fact, it might have gained something.

Capt. W. H. Sayers confined himself to reading the main portion of his paper, with but a short reference to the appendix, which was of considerably greater length than the paper itself. Lantern slides were shown of the illustrations accompanying the paper, and the lecturer further elucidated the various problems by drawings on a blackboard.

Capt. Sayers commenced his paper by paying a tribute to the early work of Mr. F. W. Lanchester, which failed to receive the recognition it deserved, at any rate in this country. It was not until much later that Lanchester's vortex theory was taken up on the Continent, mainly in Germany, while it was not until comparatively recently that due credit was given to Mr. Lanchester in Great Britain.

The lecturer then proceeded to outline the principle of the vortex theory, at the same time pointing out that he did not intend to make his paper a general guide to the theory, and referring those wishing to study it for its own sake to such works as are in existence. In giving an outline of the vortex theory the lecturer called attention to the manner in which wing drag is divided into two distinct portions—the "induced" drag, which depends upon speed and wing loading per unit of span; and the "profile" drag, due to viscous forces. It will be obvious that the "profile" drag can be found from model tests as published in this country by first calculating the "induced" drag, and subtracting this from the total drag given in British reports.

Capt. Sayers, in his paper, gave working examples of the application of the vortex theory to aircraft design, and tables of correction factors, etc., to be applied, were given, as well as the different formulæ employed in the calculations. Except for the fact that the paper as distributed contained rather a lot of printer's errors, it should be a ready guide to the use of the modern aerofoil theory in drawing office routine work, and as the errors will doubtless be corrected before the paper is published in the Minutes of the Proceedings of the Institution, to which we would refer readers wishing for full details of what was undoubtedly a very interesting and instructive paper.

### The Discussion

Mr. Bramson thought it extraordinary that that meeting should be the first public exposition of the application of the Prandtl theory in this country. He himself had attempted to study the theory from the works of Prandtl, but partly on account of the complex nature of the subject and partly because of certain difficulties in following closely the German language, he had not made much headway. After listening to Capt. Sayers's paper he had got a much better insight into the subject. He was still somewhat puzzled, however, concerning the manner in which the change took place from wing-tip vortices to trailing-edge vortices. As regards the drag, he presumed that this could be calculated from considerations of the energy required to deflect the air-stream. One very great advantage of the polar diagram was that it gave a much better picture of a wing section's characteristics than did the British method of plotting lift and drag on a basis of angle of incidence.

Major Low said he was at present doing work of a similar character for the Air Ministry, and he would make full use of Capt. Sayers's paper. Concerning the calculation of the forces on a wing, one could not take it that the atmosphere as a whole was being disturbed, and air deflected by the passage of a wing was being replaced from outside the span. He referred to some estimates made by Prandtl as to the pressure on the surface of the earth caused by an aeroplane passing overhead, and pointing out that although we did not possess instruments delicate enough to measure this change in pressure, this was really what gave an aeroplane wing its lift. It was very beautiful to think that the physicist had been able to visualise what was taking place.

◈ ◈ ◈ ◈

### Royal Aeronautical Society

COLONEL THE MASTER OF SEMPHILL has been elected chairman of the council of the Royal Aeronautical Society, in succession to Sir Sefton Brancker, who has been made president of the society. The new chairman will assume office at the opening of the new session in October.

### New York-Buenos Aires Flight

SENOR BERNARDO DUGGAN, the Argentine sportsman, who is flying from New York to Buenos Aires in a Savoia flying-boat piloted by Capt. Oliveiro, reached Paramaribo (Dutch Guiana) on June 11, and they were received by the Governor of the Colony. They left New York on May 24.

FLIGHT
AIRCRAFT ENGINEER AIRSHIP

# The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

## COMMITTEE MEETING

A MEETING of the Committee was held on Monday, June 14, 1926, when there were present :—Lieut.-Col. F. K. McClean, A.F.C., in the chair ; Mr. Ernest C. Bucknall, Lieut.-Col. M. O. Darby, Major H. Hemming, Mr. E. J. B. How, Wing-Comdr. T. O'B. Hubbard, M.C., A.F.C., Lieut.-Col. M. O'Gorman, C.B., Mr. F. Handley Page, C.B.E., Mr. T. O. M. Sopwith, C.B.E., and the Secretary.

**Election of Members.**—The following new members were elected :—F. M. Walton, J. C. Joynt, L. Openshaw, R. Barrett, S. S. A. B. Rackowe, K. H. Holley, James Williamson, Patrick Lechla, William H. Phillips, Flying Officer J. A. T. Ryde, T. H. Holt-Hughes, Lord Newborough.

**Aviators' Certificates.**—The following Aviators' Certificates were passed :—

7995. Sir John Phillips Rhodes, Bart. May 28, 1926.
7996. John Joseph Parkes. May 26, 1926.
7997. Norman John Hulbert. May 27, 1926.
7998. Ernest David Kittel. May 27, 1926.
7999. Ernest Simeon Brough. May 29, 1926.
8000. Henry Nigel St. Valery Norman. June 4, 1926.
8001. Alexander Robert Ogston. June 7, 1926.
8002. Thomas Ralston MacMillan. May 15, 1926.

**Sub-Committees.**—The reports of the Racing and Finance Committees were received and adopted.

**Air League.**—Mr. F. Handley Page was appointed to represent the Royal Aero Club on the Committee to consider the reconstitution of the Air League.

**Transport During the Strike.**—The Secretary reported on the Air Transport organised and conducted by the Royal Aero Club during the strike.

A unanimous vote of thanks was passed to H. E. Perrin, the Secretary of the Club, for his work in organising and conducting this transport.

**London Aeroplane Club.**—The appointment of Major K. M. Beaumont and Squad.-Leader M. E. A. Wright to the Committee of the London Aeroplane Club was confirmed.

**Gloucestershire Aircraft Co., Ltd.**—Letter was read from the Gloucestershire Aircraft Co., Ltd., enclosing a cheque for £100 towards the expenses of the Light Aeroplane Competition, Lympne, 1926.

A unanimous vote of thanks was passed to the Gloucestershire Aircraft Co., Ltd., for their very generous support.

## LIGHT AEROPLANE COMPETITION

ENTRIES close at 12 noon on June 30, 1926. Entry fee £10. Late entries will be received up to 12 noon on July 31, 1926. Late entry fee, £30. Entries should be made to the Royal Aero Club, 3, Clifford Street, London, W.1.

## THE KING'S CUP AIR RACE

ENTRIES close on July 2, 1926, at 12 noon. Entries should be made to the Royal Aero Club, 3, Clifford Street, London, W.1. Entry fee, £10.

## ROYAL AIR FORCE DISPLAY

MEMBERS wishing to attend the Royal Air Force Display at Hendon on Saturday, July 3, 1926, may obtain tickets at the Royal Aero Club. Enclosure 10*s.* and 5*s.*, and motor car tickets 5*s.*

It has not been found possible to make any special arrangements for the accommodation of the members, as the London Country Club was closed down some months ago, and the Chief of Air Staff has advised the Royal Aero Club that the Display, being purely service, precludes their allowing any enclosures for clubs other than the Royal Air Force Club.

Offices : THE ROYAL AERO CLUB,
3, CLIFFORD STREET, LONDON, W. 1.
H. E. PERRIN, Secretary

# LIGHT 'PLANE CLUB DOINGS

### The Lancashire Aero Club

REPORT for week ending June 11 :—

The weather has been good. Mr. Stack and Mr. Scholes were away for training at Brough from Monday until Saturday, Mr. Cantrill doing all instruction in their absence. The following had "dual" with Mr. Stack. F. Gattrell, 1 hr. 20 mins.; A. Benson, 1 hr. 20 mins.; B. Leigh, 35 mins.; A. Abdulla, 30 mins.; A. Anderson, 25 mins.; J. Leeming, 25 mins.; Mrs. Brown, 25 mins.; D. Brown, 20 mins.; A. Goodyear, 20 mins.; H. Hardy, 15 mins. Mr. Cantrill gave instruction to : A. Abdulla, 1 hr. 15 mins.; A. Benson, 50 mins.; H. Hardy, 35 mins.; C. Agar, 35 mins.; J. Leeming, 30 mins.; C. Marsland, 25 mins.; A. Goodyear, 35 mins.; W. Lilley, 20 mins.; B. Leigh 20 mins.; D. Brown, 20 mins.; E. Barnes, 20 mins.; F. Collinson, 10 mins.; — Slater, 5 mins.; Mr. Scholes gave instruction to : A. Benson, 50 mins.; A. Abdulla, 45 mins. D. Crosswaite, 40 mins.; H. Hardy, 35 mins.; D. F. Davison, 35 mins.; B. Smith, 35 mins.; P. Nicholson, 25 mins.; E. Fray, 20 mins.

The following made solo flights : Messrs. — Slater, 1 hr. 20 mins.; M. Lacayo, 1 hr. 15 mins.; R. Wilkinson, 30 mins.; A Goodfellow, 15 mins. Tests occupied 45 mins. Joy Rides 45 mins. Total solo, 3 hrs. 20 mins. Total dual, 16 hrs. 50 mins.; Total time flown, 21 hrs. 40 mins.

A portion of the Club House was opened by Colonel Groves on June 6th, and teas may now be obtained. When the remainder of the building is completed, meals will be available at all times.

During the Strike the Lancashire Club flew *Daily Mails* to Hull and Newcastle.

### London Aeroplane Club

THE total flying for the week was 30 hours. The weather prevented any flying on Thursday and Friday.

On Sunday, the 13th inst., the Club put up its record flying day, the total time being 14 hrs. 5 mins., of which 6 hrs. 5 mins. was solo flying by the Members. G. Wallcousins and C. E. Murrell have passed the flying tests for their Aviators' Certificates.

Flying Instruction was given to the following Members : L. J. C. Mitchell, G. W. Quirk, G. Eady, G. Black, F. S. Adams, T. H. O. Richardson, O. J. Tapper, E. A. Cook, J. H. Saffery, B. B. Tucker, Capt. Godfrey, J. C. Parkinson, A. R. H. Stewart, H. F. Wright, H. Solomon, W. E. P. Johnson, J. H. Links, E. D. Kittel, Miss O'Brien, Col. Farfan, A. R. W. Stewart, A. L. Angus, J. W. Garne, G. W. Hall, J. A. Simson, J. Barros, W. Hay.

The following Members made solo flights : Major K. M. Beaumont, Sir John Rhodes, A. R. Ogston, L. J. C. Mitchell, C. E. Murrell, G. Wallcousins, G. W. Quirk, A. G. D. Alderson, W. Hay, A. Lees, S. O. Bradshaw.

### The Newcastle-upon-Tyne Aero Club

REPORT for week ending June 13.—Total flying time 13 hrs. 50 mins. Dual instruction 6 hrs. 25 mins., Solo, 6 hrs. 30 mins., Joy-rides, 45 mins. Tests 10 mins.

Owing to the continuous flying which has taken place during the past few weeks, two of the Club's Cirrus engines have become due for complete overhaul at about the same time. Added to this an almost continuous downpour of rain during the week made flying impossible on most days of the week. The following members flew under instruction : Miss C. R. Leathart, Messrs. Bruce, Detchon, J. Bell, Stawart, Campbell, Shaw, and George, Dr. Dixon and Dr. Howard. Secondary dual : Mr. C. Thompson and Dr. Dixon. Solo : Mr. MacMillan, Dr. Dixon, Mr. C. Thompson.

"A" Pilots.—Mr. Heppell with Mr. J. Bell, Mr. R. N. Thompson with Mr. A. Bell.

Passengers with Maj. Packman—Miss Armitage, Miss Ormond, Mr. Stobbs.

The "Gull" is undergoing a thorough overhaul at present.

◈ ◈ ◈ ◈

### Aeronautical Exhibition in Edinburgh

To stimulate the interest of the people of Scotland in Aeronautics, a popular exhibition has been arranged in the Machinery Hall of the Royal Scottish Museum, Edinburgh, illustrating the history and development of flight. Many beautiful models representing all types of aircraft as well as a number of aero-engines ranging from the earliest types to the very latest are to be seen in the exhibition. The museum has an exceedingly interesting but small permanent collection of aircraft models, aero-engines, and specimens of aero construction, but this special exhibition has only been rendered possible through the courtesy of the following firms who have kindly lent, or in some cases presented, models and specimens for this purpose. Messrs. William Beardmore & Co., Ltd., Boulton & Paul, Ltd., The Bristol Aeroplane Co., Ltd., Brunton's Ltd., Musselburgh, The Gloucestershire Aircraft Co., Ltd., Handley Page Ltd., Imperial Airways, Ltd., D. Napier & Son, Ltd., N. V. Nederlandsche Vliegtuigenfabriek, A. V. Roe & Co., Ltd., Short Bros., Ltd., Supermarine Aviation Works, Ltd., Trost Bros. (Junkers), Vickers Ltd., and The Westland Aircraft Works.

# THE INTERNATIONAL LEAGUE OF AVIATORS

## Official Inauguration in Paris

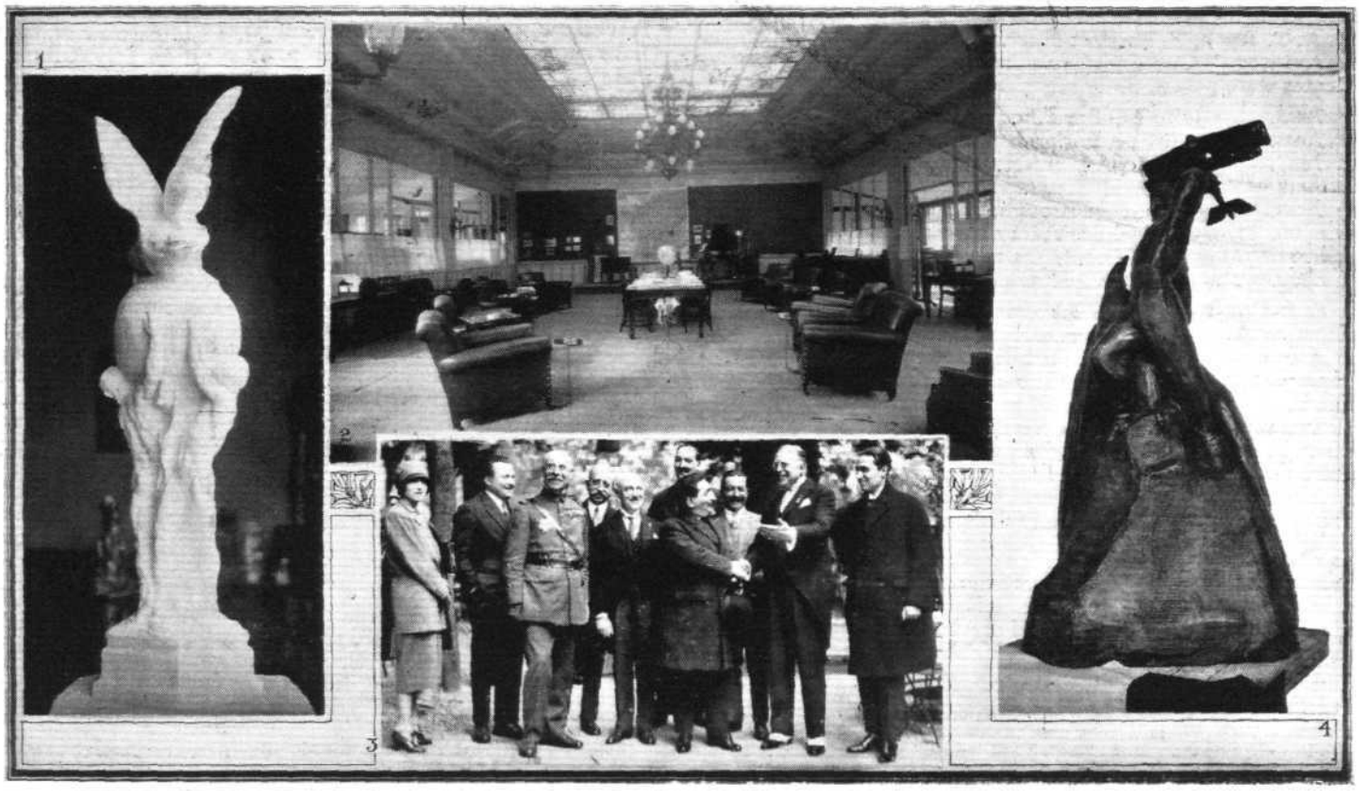
ON May 13, 1926, the new club house of the newly-formed International League of Aviators was opened by the President of the League, Mr. Clifford B. Harmon, who gave a luncheon to representatives of the press, including representatives of all the foreign newspapers published in Paris. The next day, May 14, the International League, together with "Les Vieilles Tiges," gave a reception to the various diplomatic corps stationed in Paris, and finally on May 16 the two bodies held a general reception to their numerous friends and associates. Among the many distinguished personages present was M. Laurent Eynac, French Under Secretary of State for Air, and a number of famous French "aces."

The International League of Aviators (in French abbreviated to L.I.A.) has been formed, mainly through the generosity and untiring work of Mr. Clifford Harmon, an American resident in Paris, to link together in a common brotherhood the aviators of all countries, and to provide for those on a visit to Paris a "home from home" where they can spend pleasant hours in company with aviators of other nations and "talk shop" to their heart's content. It is hoped ultimately to form branches of the League in all countries, and for a start, as far as France is concerned, the League is working in close co-operation with the famous French society "*Les Vieilles Tiges*" ("old stalks," and not, as a wag has freely translated it, "the veiled tigers"), whose President is M. Leon Bathiat.

Among the advantages which the International League of Aviators proposes to offer, in addition to its splendid club house in the Bois du Boulogne, are insurance at reduced rates, the services of famous French doctors and surgeons, suitable accommodation for the children of impecunious aviators with good French families during summer holidays, two free beds at the American hospital in Paris, and reduced prices in dealing with certain tradespeople.

The new club house of the L.I.A. (the letters have a somewhat unfortunate sound when pronounced as a word) is at *Clos Normand* in the Bois de Boulogne (Porte Maillot), and comprises a well-appointed restaurant, a reading room in which are found the aeronautical publications from all parts of the world, and where experienced stenographers proficient in numerous languages are in attendance, their office and that of the Secretary of the League adjoining the reading room. In the garden surrounding the club house small tables are arranged for those wishing to take their meals or other refreshments in the open during the summer months, many of the tables being surmounted by large parasols in bright colours. Several pavilions in the rustic style are situated in the gardens, and altogether everything possible has been done to enable aviators to foregather, when in Paris, in the most charming surroundings in a spot easy of access by Metropolitan underground, 'buses or trams, and yet far removed from the noise of the great city.

Those desiring further particulars should apply to the Secretary, *la Ligue Internationale des Aviateurs*, the *Clos Normand*, Bois de Boulogne, Paris. Incidentally, the Secretary of the L.I.A. is M. Ladislas d'Orcy, well known in French aviation circles, and who was once upon a time associated with the American aeronautical journal *Aviation*.



**THE INTERNATIONAL LEAGUE OF AVIATORS: The new Club House of the "Ligue Internationale des Aviateurs" in the Clos Normand in the Bois de Boulogne was officially opened on May 13. Our photographs show: 1, the Harmon Trophy, presented by Mr. Clifford Harmon, the founder of the League, and executed by Princess Mdivani. 2, the comfortable lounge. 3, personalities at the opening, among whom may be recognised M. Sadi Lecointe, M. Leon Bathiat (President of the "Vielles Tiges"), M. Laurent Eynac, French Under Secretary of State for Air, and Mr. Clifford Harmon. 4, the "Escadrille Lafayette" Trophy, on which are inscribed the names of those who, while serving with this famous squadron, gave their lives for freedom.**

### Pinedo's World Flight

FURTHER details regarding the Marchese de Pinedo's world flight, to begin next August are announced. Flying a Dornier "Wal" fitted with two 500 h.p. Isotta-Fraschini engines, his itinerary will probably be Rome, Gibraltar, Canary Islands, Cape Verde, Pernambuco, Buenos Aires, Santiago (*via* the Andes), San Juan Fernandez, Paumotu, Samoa, New Zealand, Australia, thence *via* his previous route to Tokyo, Peking, Calcutta, Karachi, Italian Somaliland, round Africa *via* Durban, Cape Town and east coast, and then home. The total distance flown will be in the neighbourhood of 45,000 miles.

FLIGHT

# THE ROYAL AIR FORCE

*London Gazette, June 8, 1926*

*General Duties Branch*

Air Commodore H. C. T. Dowding, C.M.G., is appointed Director of Training, Air Ministry; May 27.

Flying Officer C. E. N. Guest is granted a permanent commission in this rank; June 1. The following are granted short service commissions as Pilot Officers, on probation, with effect from and with seniority of dates indicated:—W. R. Baird; May 29. U. S. Mackay; May 30. The following Pilot Officers are promoted to rank of Flying Officer:—A. L. Ottway; Feb. 28. E. C. G. Badcock; May 15. The following Pilot Officers on probation are confirmed in rank (May 20):—L. C. Barling, W. H. Shorter.

Squadron Leader A. S. Maskell is placed on half-pay, scale B; June 10. Flight Lieut. H. O. Brown, M.M., is placed on the retired list on account of ill-health; June 9. The following Flying Officers are transferred to Reserve:—Class A.—A. H. Padley; June 7. B. R. C. Coope; June 10. L. G. Pinnell; June 10. Class C.—A. C. W. Richards; June 10. A. Thomson; June 10.

The short service commn. of Pilot Officer on probation N. E. C. Squire is terminated on cessation of duty; May 23.

*Stores Branch*

Flying Officer T. L. Grey is placed on retired list on account of ill-health; June 9.

*Medical Branch*

Flight Lieut. B. F. Haythornthwaite, M.B., B.A., is granted a permanent commn. in this rank; June 9. Flying Officer A. A. Townsend, M.B., is promoted to rank of Flight Lieut.; May 27.

*Reserve of Air Force Officers*

The following are granted commissions on probation in General Duties Branch, in ranks stated:—Class A.—Flying Officers. H. C. Adams, M.C., M. D. Barber, A. M. Diament (Lieut., R.A.R.O.); June 8. Class A.A.—Pilot Officer J. H. Gresham; May 26.

J. S. M. Michie is granted a commission in Class A.A., General Duties Branch, as a Pilot Officer on probation; May 5 (substituted for *Gazette*, May 18, 1926). Flying Officer A. M. Fitzrandolph is confirmed in rank; June 8. Flying Officer S. H. G. Trower is transferred from Class A to Class C; June 5. Flight Lieut. C. Y. Roberts is transferred from Class D.2 to Class D.1; June 8. Flight Lieut. T. A. G. Hudson is transferred from Class D.2 to Class D.1; Dec. 7, 1924 (substituted for *Gazette*, April 13, 1926). The commission of Pilot Officer on probation, K. P. L. Bowen, is terminated on cessation of duty; May 3.

## ROYAL AIR FORCE INTELLIGENCE

**Appointments.**—The following appointments in the Royal Air Force are notified:—

*General Duties Branch.*

*Squadron Leaders:* R. T. Leather, A.F.C. to H.Q., Inland Area, Stanmore, 24.5.26. L. H. Slatter, O.B.E., D.S.C., D.F.C., to R.A.F. Depot, Uxbridge, on transfer to Home Estab., 24.6.26. W. H. Dunn, D.S.C., to R..A.F. Training Base, Leuchars, 28.5.26.

*Flight Lieutenants:* T. A. Langford-Sainsbury, D.F.C., A.F.C., to No. 15 Sqdn., Martlesham Heath, 25.5.26. S. P. Simpson, M.C., to R.A.F. Depot, Uxbridge, on transfer to Home Estab., 14.5.26. D. K. Cameron to R.A.F. Depot, Uxbridge, on transfer to Home Estab., 20.5.26. B. K. D. Robertson, A.F.C., to Inland Water Transport, Iraq, 17.5.26. A. A. Ward to No. 45 Sqdn., Iraq., 21.5.26. B. E. Harrison, A.F.C., to Air Ministry, Directorate of Organisation and Staff Duties, 11.6.26. W. F. Dickson, D.S.O., D.F.C., to R.A.F. Depot, Uxbridge, 1.6.26. S. Smith, D.C.M., to No. 1 Sch. of Tech. Training (Apprentices), Halton, 14.6.26.

*Flying Officers:* H. Walker to No. 208 Sqdn., Egypt, 5.5.26. C. B. McIntyre to Home Aircraft Depot, Henlow, 9.6.26. T. Brewin, and A. E. Evans, D.F.C., to R.A.F. Depot, Uxbridge, on transfer to Home Estab., 22.5.26. H. A. Boniface to R.A.F. Depot, Uxbridge, on transfer to Home Estab., 7.5.26. J. P. Cafferkey to R.A.F. Depot, Uxbridge, 31.5.26. F. G. S. Mitchell to Armament and Gunnery Sch., Eastchurch, 10.6.26. M. C. W. C. Flint, M.C., to No. 15 Sqdn., Martlesham Heath, 28.5.26. J. Bullock to R.A.F. Depot, Uxbridge, on transfer to Home Estab., 30.4.26. (Hon. F. Lt.) W. F. Humphery to Inland Water Transport, Iraq, 11.5.26. R. A. Ford to No. 4 Armoured Car Co., Iraq., 25.5.26.

*Pilot Officers:* J. H. Leach to R.A.F. Depot, Uxbridge, 9.6.26. H. F. G. Southey to Sch. of Naval Co-operation, Lee-on-Solent, 7.6.26. W. R. Baird to No. 1 Flying Training Sch., Netheravon, on appointment to a Short Service Comm. (on probation), 29.5.26. U. S. Mackay to No.1 Flying Training Sch., Netheravon, on appointment to a Short Service Comm. (on probation), 30.5.26 W. A. Shorten to No. 27 Sqdn., India, 18.5 26.

*Stores Branch.*

*Flight Lieutenants* L. A. K. Butt, to Armament and Gunnery Sch., Eastchurch, 1.6.26. L. H. Vernon, to Headquarters, Fighting Area, Keuley, 8.6.26.

*Accountant Branch*

*Squadron Leader* E. W. Gregory, M.C., to H.Q., Air Defence of Gt. Britain, Uxbridge, 1.6.26.

*Flying Officers:* W. A. Wadley, to R.A.F. Depot, Uxbridge, 14.6.26. F. H. Wakeford, to R.A.F. Depot, Uxbridge, on transfer to Home Estab., 1.5.26.

*Flying Officers:* S. C. George to H.Q., Egypt, 4.6.26. W. J. Heneghan to No. 70 Sqdn., Iraq., 19.5.26. D. J. Sherlock, to H.Q. Accountant Office, Iraq., 18.4.26.

*Pilot Officer* R. Cassels, to No. 2 Flying Training, Sch., Digby, 7.6.26.

*Medical Branch.*

*Group Captain:* H. Cooper, D.S.O., B.A., to H.Q., Air Defence of Great Britain, Uxbridge, 1.6.26.

*Squadron Leaders:* H. B. Porteous, M.B., to H.Q., Air Defence of Great Britain, Uxbridge, 1.6.26. K. Biggs, M.C., D.P.H., to H.Q., Inland Area, Stanmore, 1.6.26. J. H. Peek, M.D., D.P.H., to H.Q., Air Defence of Great Britain, Uxbridge, 1.6.26. J. Rothwell, M.B., to H.Q., Inland Area, Stanmore, 1.6.26. J. T. T. Forbesto H.Q., Wessex Bombing Area, Andover, 1.6.26.

*Flight Lieutenants:* C. V. D. Rose, to No. 14 Sqdn., Palestine, 10.5.26. E. G. Howell, to No. 4 Flying Training Sch., Egypt, 15.5.26. A. E. Barr-Sim, M.B., to H.Q., Spec. Reserve and Aux. Air Force, 1.6.26.

*Flight Lieutenant (Dental)* P. E. Brown, to No. 10 Group H.Q., Lee-on-Solent, 31.5.26.

*Flight Lieutenants:* W. G. Weston, M.B., to Home Aircraft Depot, Henlow, 1.6.26. J. R. Crolius, M.B.,to R.A.F. Hospital, Halton, 8.6.26. G. R. Nodwell, M.B., to R.A.F. Hospital, Halton, 6.6.26. J. G. Russell, M.B., B.A., to R.A.F., British Hospital, Iraq., 16.5.26. (Hon. Sq. Ldr.) F. W. Squair, M.B., T.D., to R.A.F. Depot, Uxbridge, 5.6.26. A. Dickson, M.B., to H.Q., India, 22.5.26.

*Flying Officers:* R. S. MacLatchy, to Palestine General Hospital, 12.5.26. A. Harvey, M.B., to R.A.F. Depot, Egypt, 11.5.26.

*Flying Officer (Dental)* F. F. Anslow, to R.A.F. Depot, Uxbridge, 7.6.26.

*Flying Officers:* L. I. Hyder to R.A.F. Depot, Uxbridge, 1.7.26. S. F. Heatley, M.B., B.A., to Research Lab. and Medical Officers' Sch. of Instruction on appointment to a Short Service Comm. 2.6.26. A. A. Townsend, M.B., to No. 100 Sqdn., Spittlegate, 1.6.26. J. P. Hederman to No. 43 Sqdn., Henlow, 1.6.26. R. S. MacLatchy to R.A.F. Depot, Uxbridge, on transfer to Home Estab., 16.5.26. P. H. Perkins to Research Lab. and Medical Officers' Sch. of Instruction, on appointment to a Short Service Comm, 1.6.26.

◈ ◈ ◈ ◈

# INDEPENDENT FORCE (R.A.F.) DINNER CLUB

ON June 11 the Eighth Annual Re-Union Dinner of the Club was held at the Connaught Rooms, when Air Chief Marshal Sir H. M. Trenchard, Bart., G.C.B., D.S.O., presided for the seventh year running. Group Captain H.R.H. the Duke of York was at the last minute prevented from attending the dinner. Following an excellent banquet, at which about 58 were present, Sir Hugh Trenchard, after due honour to the King, in proposing the sole toast of the evening, "The Independent Force (R.A.F.) Dinner Club," made the briefest possible remarks, following thereby previous custom. Having paid a very strong compliment to the work of Wing-Com. Nicholl, the Honorary Secretary of the Club, and mentioned a number of distinguished names of those who had been prevented in joining them that evening, Sir Hugh said that in the R.A.F they had a worthy successor to the I.A.F. and that, conspicuous as was the Cairo flight which was just concluding, this flight was carried out in the ordinary course of R.A.F. duty. Regarding the various attacks which had, in certain quarters, been made upon the "Royal Ground Force," his only criticism of these inuendoes was that he himself was the only member of that Royal Ground Force—all the rest went into the air.

The members, following their usual custom, after the Chairman had risen, foregathered in the dining room, where one and all were able, with pianoforte interludes, to be in more intimate touch with each other than during the actual dinner, for the rest of the evening.

Those present included Air Chief Marshal Sir H. M. Trenchard, Bart., G.C.B., D.S.O.; Maj.-Gen. J. E. Dickie, C.B., C.M.G.; Brig.-Gen. G. H. Harrison, C.B., C.M.G.; Air Commodore C. L. N. Newall, C.M.G., C.B.E., A.M.; Col. Wagstaff.

Lieut.-Cols. J. Waley-Cohen, C.M.G., D.S.O.; R. C. Donaldson-Hudson, D.S.O.; F. H. L. Errington, C.B., V.D.; the Hon. Victor Russell.

Wing Commanders L. A. Pattinson, D.S.O., M.C., D.F.C.; H. R. Nicholl, O.B.E.; W. G. P. Young, O.B.E.; the Hon. M. Baring.

Majors T. V. Smith, M.C.; F. M. Iredale; S. A. Chambers; A. W. Tedder.

Squadron-Leaders W. B. Farrington, D.S.O.; C. G. Burge, O.B.E.; A. N. Benge; T. G. Gordon, M.B.E.; C. R. Cox, A.F.C.; A. Gray, M.C.

Captains T. B. Marson, M.B.E.; H. W. M. Paul; B. R. S. Jones; R. T. Wilson; S. B. Collett.

Flight-Lieuts. R. S. Topham, M.B., D.P.H., D.M.R.E.; C. B. Dick-Cleland; H. S. P. Walmsley, M.C., D.F.C.

Flying Officers R. C. Pretty; J. L. Adams; R. S. Martin.

Lieuts. A. E. Alderslade; V. C. Varcoe; F. C. Wareham; W. L. Beck.

Messrs. H. C. Burroughs, G. C. Grey, and Stanley Spooner.

## AN EFFICIENT ACCUMULATOR

FOR some time past we have had under personal observation certain models of accumulators manufactured by the Tungstone Accumulator Co., Ltd., of 3, St. Bride's House, Salisbury Square, London, E.C. 4, and possibly our experiences may be of some value to those of our readers who may be interested in a really extraordinarily efficient accumulator, for use either in a motor-car, or for wireless purposes.

The Tungstone accumulator, it should be mentioned, possesses certain original and revolutionary features in its construction which, it is claimed, are the means of overcoming many of the faults or troubles associated with accumulators in general—mainly centred round the lead plates or grids. It is not possible for us to write here regarding these troubles, nor to give a detailed description of the Tungstone accumulator. We can only just briefly outline the letters, main features, and would ask those of our readers who desire fuller information to obtain from the makers an extremely interesting booklet they have produced on the subject.

The fundamental patented basis of all Tungstone accumulator plates is a grid unit of pure lead die cast under high pressure, with a supporting bracing frame of acid-resisting metal or wood. Plates of any required thickness can be made by superimposing the necessary number of grid units. These pure lead units are cemented together in one operation on all four sides by a thin bar of liquid antimonial lead, pressure fed into the recessed and hidden grooves of the outer edges of each unit—the metal frame is continuously cemented, together as a completed plate on all the four sides.

The paste (pure lead oxide), under controlled machine pressure, is riveted into both sides simultaneously and through the entire depth of the interlacing holes of the grid (which is a lattice basket design), thereby making a homogeneous lead and paste plate, with excellent porosity qualities. Thus, the advantages of the pure lead plate are obtained without its disadvantages, whilst the faults of the antimonial lead grid plate type are, it is claimed, avoided.

So much for the principles of the Tungstone accumulator, and it only remains now for us to report our personal experiences with this accumulator. As far as our tests have gone, it seems that the claims made for the Tungstone are entirely borne out in practice. In the case of a car battery we found that a vast improvement in starting up resulted, and that we were getting appreciably more "juice" through the starter than we had ever got before. Furthermore, rough usage and "accidental" shorts appeared to have little or no effect on the plates. In fact, this accumulator seems to be capable of extraordinarily heavy discharges without hurt. Re-charging is also a less worrying business compared with the ordinary accumulator, as there is less danger of the plates buckling in the event of a high or over-charge.

As regards the 60 V.H.T. wireless battery, we have found this highly satisfactory in operation, and quite a pleasure in its smoothness of action after the ordinary "flash battery" type. Of course, all the advantages claimed for the Tungstone—which obtain in the H.T. model as well—are obviously of considerable importance in the case of a H.T. battery for wireless work, when ordinarily we have thirty or more small and somewhat delicate units to deal with.

In conclusion, we think it can truly be said that the Tungstone is a very important advance in the development of electrical science.

* * * *

### Palmer Tyres

THE Palmer Tyre, Ltd. (100-106, Cannon Street, E.C. 4), state that certain tyres are being offered for sale which are represented to be Palmer cord tyres suitable for motor-cars, while they are, in fact, Palmer cord aero tyres of old manufacture or surplus war stock which have been altered so as to appear to be motor-car or motor-cycle tyres. In many cases the figures 700 × 100, which indicate an aeroplane tyre size, have been removed and the figures 710 × 90 or 700 × 80, the well-known motor-car sizes (or in some cases 710 × 90 × 100), have been stuck to the side of the cover in their place. In addition, the words "aero tyre" have been buffed out and diagonal grooves cut in the tread surface to give a diamond-tread effect. The Palmer Tyre, Ltd., desire it to be understood that such tyres are entirely unsuitable for use on motor-cars and the sale or offering for sale thereof renders the persons concerned liable to prosecution under the Merchandise Marks Acts. The Palmer Tyre, Ltd., ask that any person who has purchased any of these tyres would be so good as to communicate with them and give them any information he may have in connection therewith.

## SOCIETY OF MODEL AERONAUTICAL ENGINEERS (S.M.A.E.)

A WELL-ATTENDED meeting for the Gamage Challenge Cup competition took place on June 5 at Wimbledon Common. Good weather and a variety of types of machines made the flying of interest. The results were as follows:—

*Gamage Cup Competition*

(Points awarded on formula: Average duration of three flights $\times \sqrt{\text{loading.}}$)

| | Average Duration of Three Flights. Seconds. | Points ($D \times \sqrt{L}$). |
|---|---|---|
| 1st, T. H. Newell .. .. | 63 | 130 |
| 2nd, D. A. Pavely .. .. | 45·7 | 110 |
| 3rd, S. C. Hersom .. .. | 31·9 | 62·4 |

The following are the rules for the FLIGHT Cup competition, to be held at Sudbury on July 17 at 3 p.m., for Autogiro models:—

1. The model must represent what is at present generally understood by an "Autogiro" machine, that is, one in which the ordinary form of fixed main plane is substituted by a series of lifting surfaces rotating about a vertical axis. (For a further description *see* FLIGHT, October 22, 1925.)
2. Minimum weight of model to be 4 ozs.
3. The model may be either the "spar" or "fuselage" type.
4. The machine may be a "tractor" or a "pusher," and any number of airscrews for producing forward motion may be used.
5. The number of "planes" on the so-called "windmill" to be optional.
6. The competition is to be for distance. Points will be given for every foot flown exceeding 300 ft. (*i.e.*, the minimum qualifying distance to be 300 ft. and with a minimum duration of 20 secs.).
7. The competition is open to members only.
8. First prize, FLIGHT Cup and £2 2*s.* cash; second prize, £1 1*s.*; third prize, 10*s.* 6*d.*

Communications should be addressed to 58, Norton Road, Wembley.

B. K. JOHNSON, *Hon. Secretary*

* * * *

## PUBLICATIONS RECEIVED

*Aeronautical Research Committee Reports and Memoranda*: *No.* 978 (*Ae.* 192).—Measurement of the Rotary Derivative $M_q$ on the 1/5th Scale Model Bristol Fighter in the Duplex Wind Tunnel. By E. F. Relf. June, 1925. Price 1*s.* net. *No.* 996.—On the Necessary Size of Aerodromes in Order that a Landing may be made if the Engine Fails when Getting Off. By H. Glauert. January, 1926. Price 6*d.* net. H.M. Stationery Office, Kingsway, London, W.C. 2.

* * * *

## AERONAUTICAL PATENT SPECIFICATIONS

*Abbreviations*: Cyl. = cylinder; i.c. = internal combustion: m. = motor. The numbers in brackets are those under which the Specifications will be printed and abridged, etc.

**APPLIED FOR IN 1925**

*Published June* 17, 1926

4,070. V. HAGGER. Cowling, etc., for aircraft. (252,061.)
4,480. DOUGLAS MOTORS, LTD., and C. G. PULLIN. Lubrication. (252,076.)
4,629. C. R. FAIREY. Radiators. (252,082.)
4,839. DOUGLAS MOTORS, LTD., and C. G. PULLIN. Built-up crankshafts. (252,251.)
5,206. DOUGLAS MOTORS, LTD., and C. G. PULLIN. Taps for controlling liquid-fuel supply. (252,275.)
5,441. ARMSTRONG SIDDELEY MOTORS, LTD., and S. M. VIALE. Throttle mechanism for aircraft engines. (252,087.)
5,442. ARMSTRONG SIDDELEY MOTORS, LTD., and S. M. VIALE. Valve-operating gear for fluid-pressure engines. (252,280.)
15,180. L. L. IRVIN. Parachute shroud lines. (252,095.)


# FLIGHT

*The Aircraft Engineer and Airships*

36, GREAT QUEEN STREET, KINGSWAY, W.C.2.

Telegraphic address: Truditur, Westcent, London.
Telephone: Gerrard 1828.

## SUBSCRIPTION RATES

"FLIGHT" *will be forwarded, post free, at the following rates*:—

| UNITED KINGDOM | s. | d. | ABROAD* | s. | d. |
|---|---|---|---|---|---|
| 3 Months, Post Free .. | 7 | 7 | 3 Months, Post Free .. | 8 | 3 |
| 6 ,, ,, .. | 15 | 2 | 6 ,, ,, .. | 16 | 6 |
| 12 ,, ,, .. | 30 | 4 | 12 ,, ,, .. | 33 | 0 |

* *Foreign subscriptions must be remitted in British currency.*

*Cheques and Post Office Orders should be made payable to the Proprietors of* "FLIGHT," 36, Great Queen Street, Kingsway, W.C.2, *and crossed Westminster Bank.*